

(12) UK Patent Application (19) GB (11) 2 377 881 (13) A

(43) Date of A Publication 29.01.2003

(21) Application No 0127889.4

(22) Date of Filing 21.11.2001

(30) Priority Data

(31) 200144753 (32) 25.07.2001 (33) KR

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(51) INT CL⁷

A47L 9/16

(52) UK CL (Edition V)

A4F FFD

(56) Documents Cited

EP 0972573 A

EP 0928594 A

(58) Field of Search

UK CL (Edition T) A4F FFD, B2P

INT CL⁷ A47L 9/16, B04C 5/02 5/04 5/06 5/08 5/103 5/185

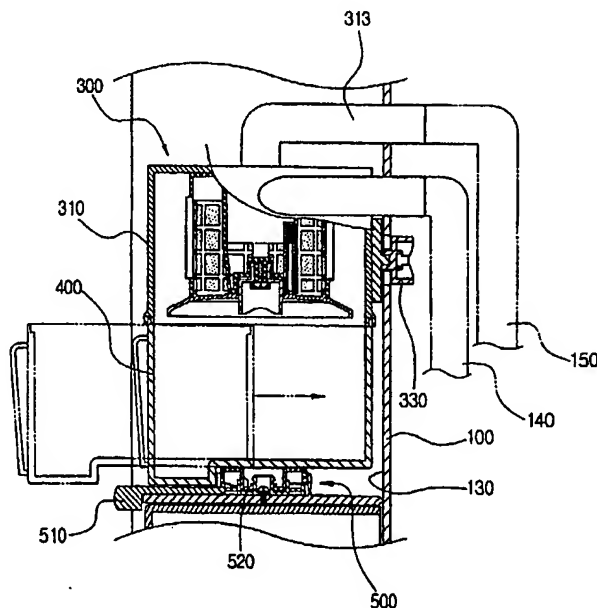
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(54) Abstract Title

Cyclone dust collecting apparatus and upright-type vacuum cleaner

(57) A cyclone dust collecting apparatus comprising: a cyclone body (310) that has an inflow passage (Fig 2, 311) and a outflow passage (Fig 2, 313), and is removably connected with a cleaner body 100; a grill body (Fig 4, 340) that has a connection passage (Fig 4, 341) for being connected with the outflow passage; a shielding member (Fig 4, 350) removably connected with the grill body in order to shield a lower opening of the grill body; a dust collector (400) removably connected with a lower part of the cyclone body in order to collect dust separated in the cyclone body; and blocking means (Fig 4, 380) for preventing the dust collector from being connected with the cyclone body when the shielding member is not assembled at the grill body, and an upright-type vacuum cleaner applying the same.

FIG.3



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FIG. 1

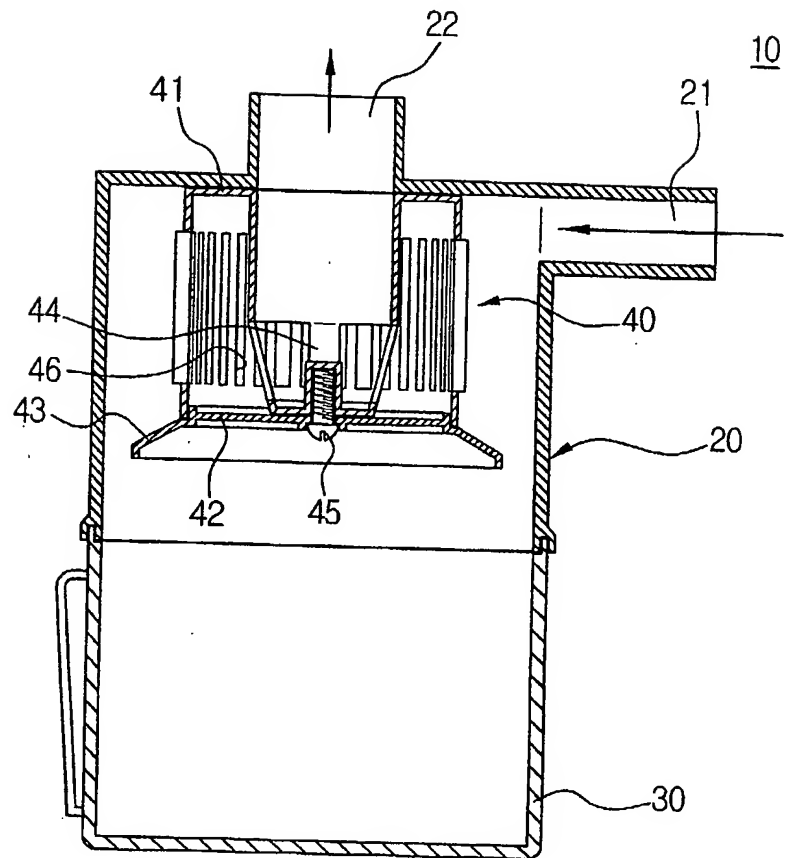


FIG. 2

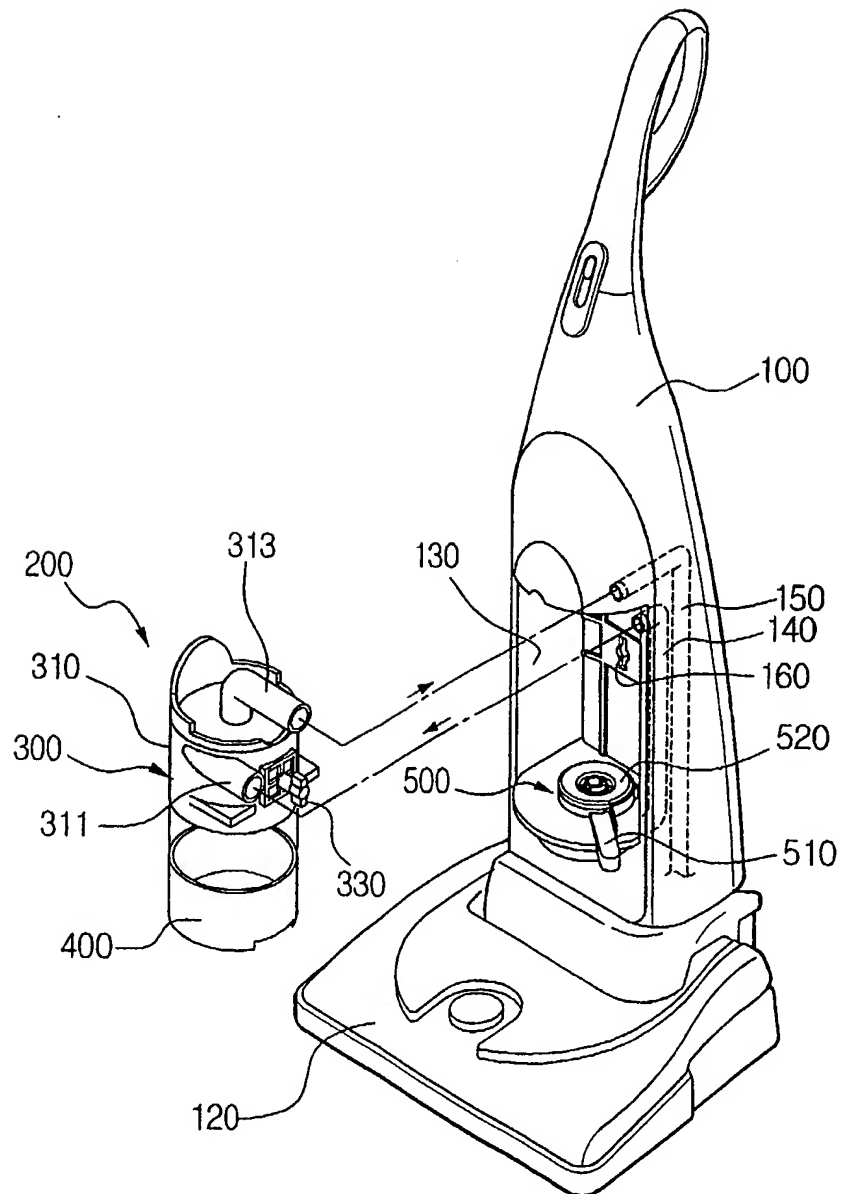


FIG. 3

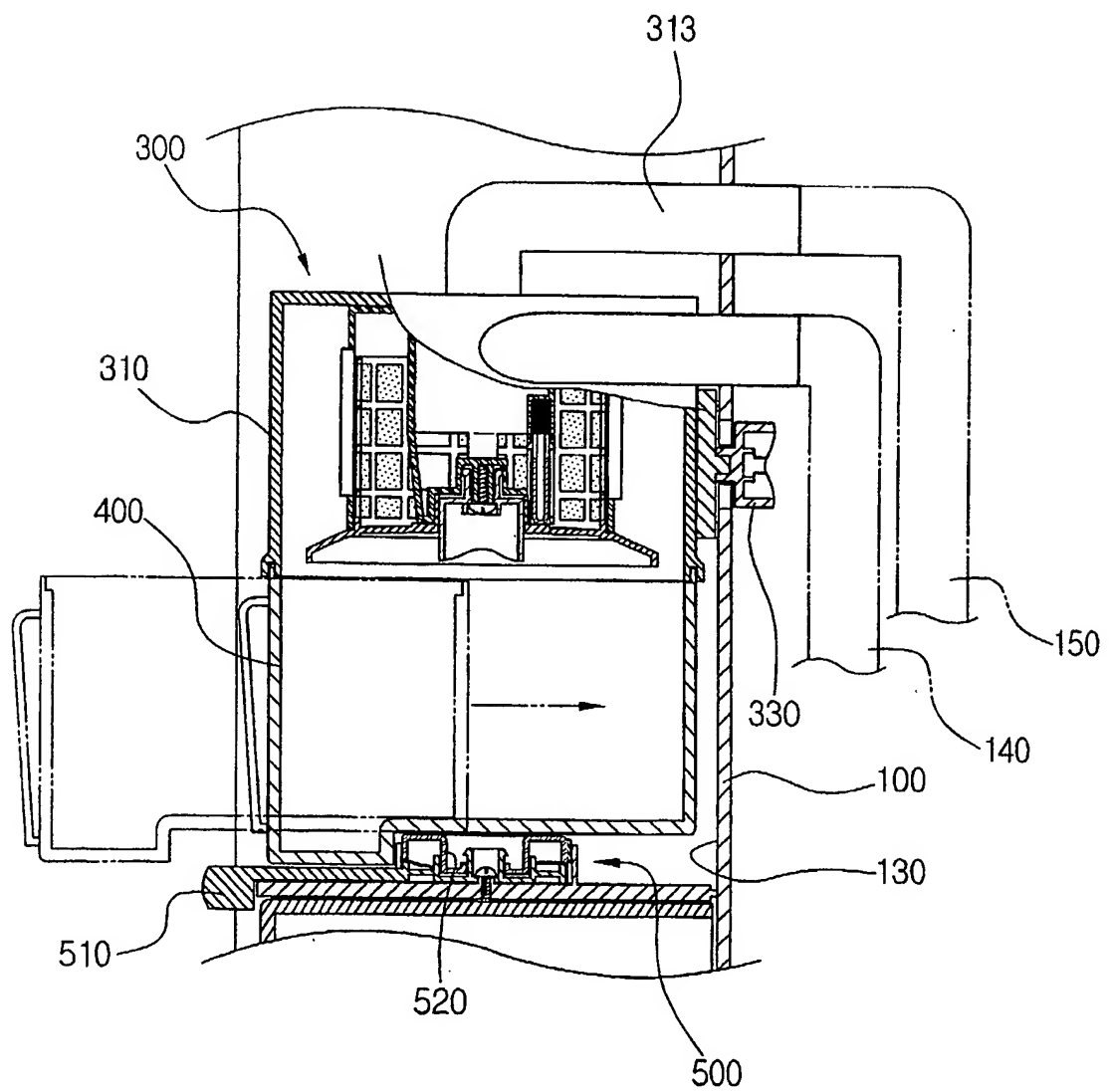


FIG. 4

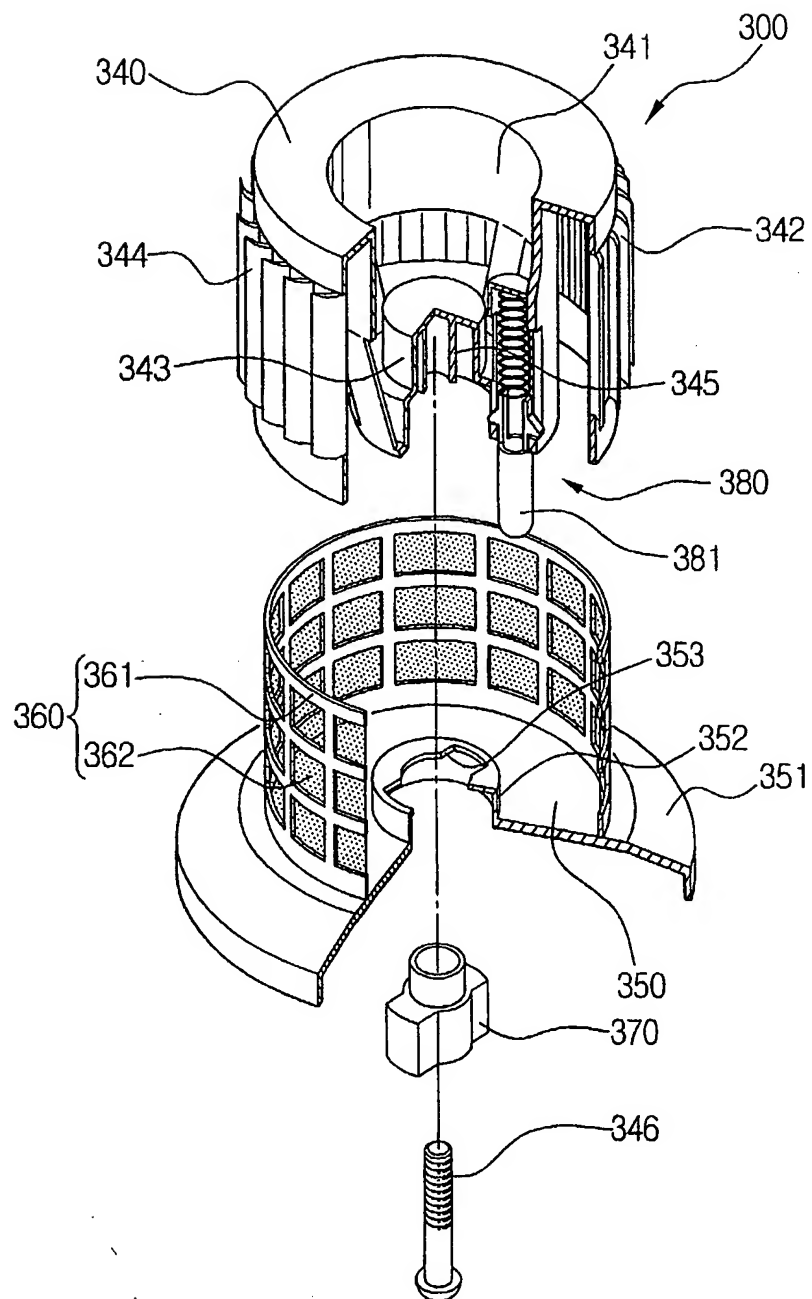
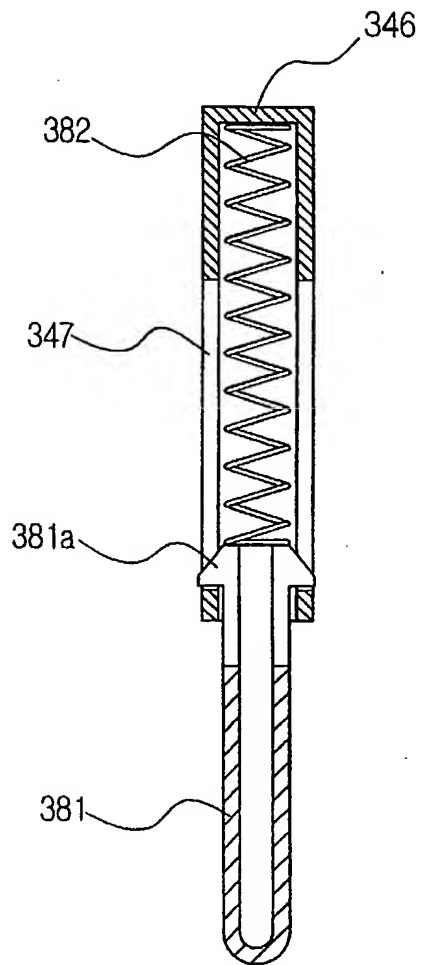
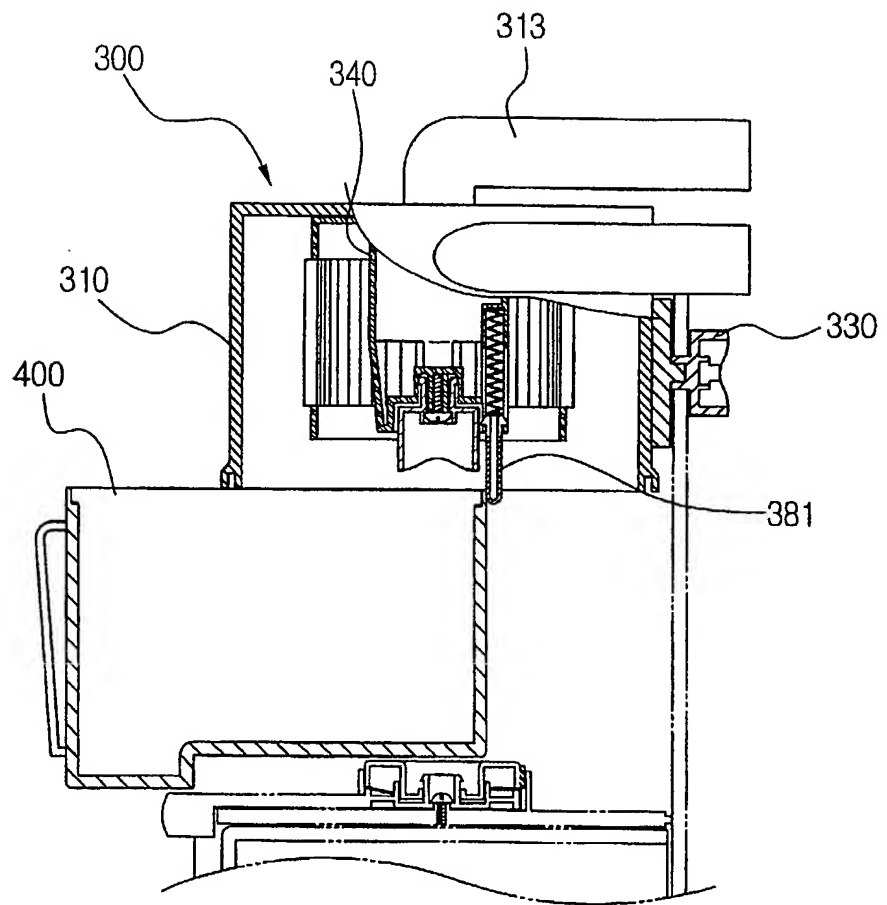


FIG. 5



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FIG.6



**CYCLONE DUST COLLECTING APPARATUS AND
UPRIGHT-TYPE VACUUM CLEANER**

BACKGROUND OF THE INVENTION

5 1. Field of the Invention

The present invention relates to a cyclone dust collecting apparatus and an upright-type vacuum cleaner.

 2. Description of the Related Art

10 A conventional cyclone dust collecting apparatus 10 for a vacuum cleaner shown in FIG. 1, comprises a cyclone body 20, a dust collector 30, and a grill assembly 40. The grill assembly 40 is connected with the cyclone body 20 by a connection member (not shown).

 An inflow passage 21 connected with a brush assembly (not shown) of
15 the vacuum cleaner is disposed at an upper part of the cyclone body 20. An air drawn into through the inflow passage 21 flows in a tangential direction of the cyclone body 20 and forms a whirling air current.

 An outflow passage 22 is disposed at an upper center of the cyclone body 20. A grill assembly 40 for preventing a dust from being drawing into a vacuum
20 generating device, that is, a motor driving unit is disposed at an inlet of the outflow passage 22.

 The grill assembly 40 has a grill body 41 and a sealing member 42. The

grill body 41 has a plurality of passages 46 formed therein, in order to draw the air into. A dust back flow preventing unit 43 is formed at an out side of a circumferential direction of the sealing member 42.

5 An upper part of the grill body 41 is connected with the outflow passage 22, and a lower part of the grill body 41 is shielded by the shielding member 42. The shielding member 42 is removably connected with the grill body 41 by a screw 45.

10 In the above construction, a user separates the cyclone dust collecting apparatus 10 from the vacuum cleaner to cleanse or repair the cyclone dust collecting apparatus. Then, the user should separate the dust collector 30 from the cyclone body 20, and the shielding member 42 from the grill body 41. After finishing cleaning and repairing of the cyclone dust collecting apparatus, the shielding member 42 should be reassembled. Next, the dust collector 30 is reassembled, and finally, the cyclone dust collecting apparatus 10 should be
15 reinstalled at the cleaner.

In the meantime, the applicant disclosed an upright-type vacuum cleaner under the Korean patent application number 2001-31233, which has not been published. In the disclosed vacuum cleaner, the cyclone body is secured to the vacuum cleaner by a locking knob, and the dust collector is
20 removably installed at a lower part of the cyclone body by a locking unit. In the vacuum cleaner having the above construction, only the dust collector is separated and reinstalled without separating the cyclone dust collecting

apparatus from the vacuum cleaner, when the user removes dust. Thus, it is convenient for the user to use the vacuum cleaner.

On the other hand, when the cyclone dust collecting apparatus of FIG. 1 is applied to an upright-type vacuum cleaner by using the advantage of the vacuum cleaner disclosed as the above-mentioned unpublished application, there is an advantage of high dust collecting effect and the user can use the vacuum cleaner conveniently also.

However, if the dust collector 30 is removably connected with the cyclone body 20 in a construction of FIG. 1, the vacuum cleaner can be operated in the status that the shielding member 42 is not assembled at the grill body 41 due to the user's mistake. In this case, the dust can be directly drawn into the motor driving unit through a lower opening of the grill body 41.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a cyclone dust collecting apparatus and an upright-type vacuum cleaner having an improved structure, which is capable of preventing a dust collector from being assembled when a shielding member is not assembled to a grill body.

The above object of the present invention is accomplished by providing a cyclone dust collecting apparatus for an upright-type vacuum cleaner comprising: a cyclone body that has an inflow passage and a outflow passage, and is removably connected with a cleaner body; a grill body that has a

connection passage for being connected with the outflow passage; a shielding member removably connected with the grill body in order to shield a lower opening of the grill body; a dust collector removably connected with a lower part of the cyclone body in order to collect dust separated in the cyclone body;
5 and blocking means for preventing the dust collector from being connected with the cyclone body when the shielding member is not assembled at the grill body.

It is preferable that the blocking means includes: a stopper pin disposed at the grill body for moving upwardly and downwardly in order to prevent the dust collector from moving horizontally by protruding to a lower end of the
10 cyclone body when the stopper pin moves downwardly; and a spring for flexibly pressing the stopper pin downwardly, the stopper pin moves upwardly by being pushed by the shielding member connected with the grill body.

In addition, the grill body includes a guide unit for guiding the movement of the stopper pin and accommodating the spring.

15 Moreover, the guide unit has at least one slot formed up and down therein, and a locking member, for being connected with the slot in order to prevent the stopper pin from being separated, is protruded from an out side of the stopper pin.

An upright-type vacuum cleaner according to the present invention to
20 accomplish the object of the present invention comprises: a cleaner body that has a settling unit, the settling unit has an outflow path connected with the motor driving unit and an inflow path connected with a suction brush; a

cyclone unit installed at the settling unit in order to separate dust from an air drawn into through the inflow path, and discharge the clean air to the outflow path; a dust collector removably connected with a lower part of the cyclone unit in order to collect the separated dust in the cyclone unit, and the cyclone unit
5 comprises: a cyclone body, removably connected with the settling unit, having an inflow passage and an outflow passage; a locking knob rotatably disposed at the cyclone body in order to be removably connected with a knob connection hole formed at an inside wall of the settling unit; a grill body having a connection passage connected with the outflow passage; a shielding member
10 removably connected with the grill body in order to shield a lower opening of the grill body; and blocking means for preventing the dust collector from being connected with the cyclone body when the shielding member is not assembled at the grill body.

Here, it is preferable that the dust collector is secured by a locking unit
15 that moves upwardly and downwardly, and the locking unit is disposed at a lower part of the settling unit.

Furthermore, it is advisable that the upright-type vacuum cleaner comprises: a locking lever rotatably disposed at a lower part of the grill body; and a penetrating hole formed at a corresponding part to the shielding member
20 so that the locking lever can pass through at a certain position.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic sectional view showing a conventional cyclone dust collecting apparatus;

FIG. 2 is an exploded perspective view schematically showing an upright-type vacuum cleaner according to the preferred embodiment of the present invention;

FIG. 3 is a schematic sectional view showing the cyclone dust collecting apparatus of FIG. 2;

FIG. 4 is an exploded perspective view showing the cyclone unit of FIG. 3;

FIG. 5 is a sectional view showing an important part extracted from FIG. 4; and

FIG. 6 is a schematic sectional view showing the operation of the cyclone dust collecting apparatus according to the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

From now on, the preferred embodiment of the present invention will be described in great detail by referring to the appended drawings.

Referring to FIG. 2, an upright-type vacuum cleaner according to the preferred embodiment of the present invention comprises a cleaner body 100 and a cyclone dust collecting apparatus 200.

A vacuum generating device (not shown), that is a motor driving unit is disposed inside of the cleaner body 100. In addition, a suction brush 120 is movably connected with a lower part of the cleaner body 100. A cyclone settling unit 130 is disposed at a front center of the cleaner body 100. An inflow path 140 connected with the suction brush 120 and an outflow path 150 connected with the motor driving unit are disposed inside of the cyclone settling unit 130.

The cyclone dust collecting apparatus 200 comprises a cyclone unit 300 for separating a dust drawn into through the inflow path 140 and discharging the clean air to the outflow path 150, and a dust collector 400 removably connected with a lower part of the cyclone unit 300 in order to collect the separated dust.

The cyclone unit 300 comprises a cyclone body 310 having an inflow passage 311 and an outflow passage 313. The dust drawn into through the suction brush 120 flows to an inside of the cyclone unit 300 through the inflow path 140 and the inflow passage 311. The inflow passage 311 is disposed for the air drawn into to flow in a tangential direction of the cyclone unit 300. Therefore, the air drawn into through the inflow passage 311 forms a whirling air current along an inside wall of the cyclone unit 300.

Furthermore, the cyclone unit 300 includes a locking knob 330 rotatably disposed at an outer circumference of the cyclone body 310. The locking knob 330 is removably connected with a knob connection hole 160 formed at an inside wall of the cyclone settling unit 130. Thus, when the

cyclone body 310 is connected with the cyclone settling unit 130, a user passes the locking knob 330 through the knob connection hole 160 and rotates the locking knob 330 for 90°, the cyclone unit 300 is firmly secured to the cleaner body 100.

5 Moreover, a locking unit 500 moving upwardly and downwardly is disposed at a lower side of the cyclone settling unit 130. As shown in FIG. 3, the dust collector 400 is removably secured to a lower part of the cyclone unit 300, that is a cyclone body 310 by the locking unit 500. The locking unit 500 has a construction to move a locking disk 520 upwardly and downwardly in
10 accordance with a rotation of a operation lever 510. Accordingly, in the status that the dust collector 400 is mounted on an upper part of the locking unit 500, the dust collector 400 is lifted in accordance with the rotation of the operation lever 510 and adheres to a lower part of the cyclone body 310 or is separated from the cyclone body 310. The construction and the operation of the
15 locking unit 500 is disclosed in great detail in unpublished patent application No. 2001-3123, thus the description about the locking unit 500 will be omitted here.

As described so far, the cyclone unit 300 is secured to the cyclone settling unit 130, and only the dust collector 400 can be separated and
20 installed. In other words, the user moves the dust collector 400 horizontally along a direction of the arrow in FIG. 2, and places the dust collector 400 at the lower part of the cyclone unit 300. Then, the user operates the locking unit 400

to connect the dust collector 400 with the cyclone unit 300. It is preferable that the upper end of the dust collector 400 and the lower end of the cyclone body 310 are sloped to be corresponded to each other for guiding the horizontal movement of the dust collector 400.

5 In addition, as shown in FIG. 4, the cyclone unit 300 comprises: a grill body 340 having a connection passage 341 connected with the outflow passage 313; a shielding member 350 for shielding a lower part of the grill body 340; and blocking means 380.

 The grill body 340 has a grill unit 342, the connection passage 341, and
10 a shielding member connection unit 343. The grill unit 342 has a passage 344 of a predetermined type formed therein in order to prevent the dust from being drawn into but secure the free inflow of the air. In the grill body 340 having the above construction, the connection passage 341 opened upwardly is connected with the outflow passage 313. A lower opening of the grill body 340 is shielded
15 by the shielding member 350.

 A dust back-flow prevent unit 351 is formed at an outside of a circumferential direction of the shielding member 350. The dust back-flow prevent unit 351 converts a direction of the dust included in an air current that flows to the grill body 340 into the lower side of the cyclone unit 300.

20 Furthermore, a filter support unit 361 and filtering means 360 having a filter 362 can be installed at the shielding member 350. The filter support unit 361 is integrally formed with the shielding member 350, and the filter 362

is inserted in the filter support unit 361.

On the other hand, a locking lever 370 is disposed at a lower side of the grill body 340. A hinge shaft 345 is protruded from a lower side of the grill body 350. The locking lever 370 is rotatably connected with the hinge shaft 345 by a screw 346. Moreover, a locking lever connection unit 352 is disposed at a corresponding place to the locking lever 370 at the shielding member 350. A penetrating hole 352 for the locking lever 370 passing through is formed at the locking lever connection unit 352. A cam unit is formed around the penetrating hole 352, that is a lower side of the locking lever connection unit 352. In the above construction, if the user passes the locking lever 370 through the penetrating hole 353, and rotates the locking lever 370 for 90°, then the shielding member 350 is firmly secured to the grill body 340. In other words, without using a separate tool, the shielding member 350 can be installed to the grill body 340 and separated from the grill body 340. Here, the construction and the operation of the locking lever 370 and the locking lever connection unit 352 is described in great detail in unpublished Korean patent application number 2001-43286, thus the description will be omitted here.

The blocking means 380 prevents the dust collector 400 from being connected with the cyclone body 310, when the shielding member 350 is not assembled at the grill body 340. In other words, since the lower side of the grill body 340 is opened, the dust collector 400 can be assembled in the status that the shielding member 350 is not assembled. In this case, if the user operates

the vacuum cleaner, the dust drawn into the cyclone unit 300 directly flows to the motor driving unit through the lower opening of the grill body 340. Therefore, to prevent this kind of mistake in advance, the shielding member 380 is disposed. The shielding member 380 comprises a stopper pin 381
5 disposed at the grill body 340 in order to move upwardly and downwardly, and a spring 382 for flexibly pressing the stopper pin 381 downwardly. The stopper pin 381 is accommodated in a guide unit 346 disposed in a length direction of the grill body 340, and moves upwardly and downwardly.

Referring to FIG. 5, a slot 347 for guiding the up and down movement
10 of the stopper pin 381 is disposed in a length direction at the guide unit 346. In addition, a locking member 381a is disposed at an upper end of the stopper pin 381 in order to prevent the stopper pin 381 from being separated from the guide unit 347 by being connected with the slot 347. The upper end of the stopper pin 381 is partly cut. Thus, the stopper pin 381 can be connected with
15 the guide unit 347 in the status that each locking member 381a becomes flexibly narrower.

The stopper pin 381 controls the horizontal movement of the dust collector 400 by being protruded for a lower end of the stopper pin 381 to be placed lower than a lower end of the cyclone body 310, when the stopper pin
20 381 goes down. Moreover, the stopper pin 381 is pushed by a shielding member 350 assembled to the grill body 340, and inserted into the guide unit 346 so that the dust collector 400 can be assembled.

In other words, as shown in FIG. 6, when the shielding member 350 is separated from the grill body 340, the stopper pin 381 is protruded to the lower side of the grill body 340.

In this status, if the user horizontally moves the dust collector 400 to assemble the dust collector 400 to the cyclone body 310, the upper end of the dust collector 400 is locked at the stopper pin 381. Accordingly, the dust collector 400 can be prevented from being assembled when the shielding member 350 is not assembled. Consequently, it can be prevented that the user separates the shielding member 350 and operates the vacuum cleaner by mistake, and the dust is not separated in the cyclone body 310 and directly discharged to the motor driving unit.

In the meantime, as shown in FIG. 3, when the shielding member 350 is assembled at the grill body 340, the stopper pin 381 is accommodated into the guide unit 346 by the assembled shielding member 350. In this status, if the dust collector 400 is horizontally moved in an arrow direction, the dust collector 400 is placed at the lower part of the cyclone unit 300. Then, if the dust collector 400 goes up by the operation of the locking unit 500 that moves up and down, the dust collector 400 is assembled at the lower end of the cyclone body 310.

According to the cyclone dust collecting apparatus and the upright-type vacuum cleaner according to the present invention described so far, the dust collector 400 can be prevented from being assembled at the cyclone body 310

when the shielding member 350 is not assembled at the grill body 340. In other words, the dust collector 400 cannot be assembled when the shielding member 3350 is not assembled, thus, the vacuum cleaner is not operated and consequently, the dust cannot flow to the motor driving unit.

5 Therefore, the vacuum cleaner has less possibility of having an out of order and the security and the credibility of the vacuum cleaner will be increased.

 So far, the preferred embodiment of the present invention has been illustrated and described. However, the present invention is not limited to the
10 preferred embodiment described here, and someone skilled in the art can modify the present invention without distorting the point of the present invention claimed in the claim part.

CLAIMS

1. A cyclone dust collecting apparatus for an upright-type vacuum cleaner, comprising:

a cyclone body that has an inflow passage and an outflow passage,

5 and is removably connected with a cleaner body;

a grill body that has a connection passage for being connected with the outflow passage;

a shielding member removably connected with the grill body in order to shield a lower opening of the grill body;

10 a dust collector removably connected with a lower part of the cyclone body in order to collect dust separated in the cyclone body; and

blocking means for preventing the dust collector from being connected with the cyclone body when the shielding member is not assembled at the grill body.

15

2. The cyclone dust collecting apparatus for an upright-type vacuum cleaner of claim 1, wherein the blocking means includes:

a stopper pin disposed at the grill body for moving upwardly and downwardly in order to prevent the dust collector from moving horizontally by

20 protruding to a lower end of the cyclone body when the stopper pin moves downwardly; and

a spring for flexibly pressing the stopper pin downwardly,

the stopper pin moves upwardly by being pushed by the shielding member connected with the grill body.

3. The cyclone dust collecting apparatus for an upright-type vacuum cleaner of claim 2, wherein the grill body includes a guide unit for guiding the movement of the stopper pin and accommodating the spring.

4. The cyclone dust collecting apparatus for an upright-type vacuum cleaner of claim 3, wherein the guide unit has at least one slot formed up and down therein, and a locking member, for being connected with the slot in order to prevent the stopper pin from being separated, is protruded from an outer side of the stopper pin.

5. An upright-type vacuum cleaner, comprising:
a cleaner body that has a settling unit, the settling unit has an outflow path connected with the motor driving unit and an inflow path connected with a suction brush;

a cyclone unit installed at the settling unit in order to separate dust from an air drawn into through the inflow path, and discharge the clean air to the outflow path;

a dust collector removably connected with a lower part of the cyclone unit in order to collect the separated dust in the cyclone unit,

wherein the cyclone unit comprises:

a cyclone body, removably connected with the settling unit, having an inflow passage and an outflow passage;

5 a locking knob rotatably disposed at the cyclone body in order to be removably connected with a knob connection hole formed at an inside wall of the settling unit;

a grill body having a connection passage connected with the outflow passage;

10 a shielding member removably connected with the grill body in order to shield a lower opening of the grill body; and

blocking means for preventing the dust collector from being connected with the cyclone body when the shielding member is not assembled at the grill body.

6. The upright-type vacuum cleaner of claim 5, wherein the dust collector
15 is secured by a locking unit that moves upwardly and downwardly, and the locking unit is disposed at a lower part of the settling unit.

7. The upright-type vacuum cleaner of claim 5 or 6, comprises:

a locking lever rotatably disposed at a lower part of the grill body; and

20 a penetrating hole formed at a corresponding part to the shielding member so that the locking lever can pass through at a certain position.

8. An upright-type vacuum cleaner substantially as described and illustrated herein with reference to Figures 2 to 6 of the accompanying drawings.

Amendments to the claims have been filed as follows

1. A cyclone dust collecting apparatus for an upright-type vacuum cleaner, comprising:

a cyclone body that has an inflow passage and an outflow passage,

5 and is removably connected with a cleaner body;

a grill body that has a connection passage for being connected with the outflow passage;

a shielding member removably connected with the grill body in order to shield a lower opening of the grill body;

10 a dust collector removably connected with a lower part of the cyclone body in order to collect dust separated in the cyclone body; and

blocking means for preventing the dust collector from being connected with the cyclone body when the shielding member is not assembled at the grill body.

15

2. The cyclone dust collecting apparatus for an upright-type vacuum cleaner of claim 1, wherein the blocking means includes:

a stopper pin disposed at the grill body for moving upwardly and downwardly in order to prevent the dust collector from moving horizontally by
20 protruding beyond a lower end of the cyclone body when the stopper pin moves downwardly; and

a spring for flexibly pressing the stopper pin downwardly,

the stopper pin moves upwardly by being pushed by the shielding member connected with the grill body.

3. The cyclone dust collecting apparatus for an upright-type vacuum cleaner of claim 2, wherein the grill body includes a guide unit for guiding the movement of the stopper pin and accommodating the spring.

4. The cyclone dust collecting apparatus for an upright-type vacuum cleaner of claim 3, wherein the guide unit has at least one slot formed up and down therein, and a locking member, for being connected with the slot in order to prevent the stopper pin from being separated, is protruded from an outer side of the stopper pin.

5. An upright-type vacuum cleaner, comprising:
a cleaner body that has a settling unit, the settling unit has an outflow path connected with the motor driving unit and an inflow path connected with a suction brush;

a cyclone unit installed at the settling unit in order to separate dust from an air drawn into through the inflow path, and discharge the clean air to the outflow path;

a dust collector removably connected with a lower part of the cyclone unit in order to collect the separated dust in the cyclone unit,

wherein the cyclone unit comprises:

a cyclone body, removably connected with the settling unit, having an inflow passage and an outflow passage;

5 a locking knob rotatably disposed at the cyclone body in order to be removably connected with a knob connection hole formed at an inside wall of the settling unit;

a grill body having a connection passage connected with the outflow passage;

10 a shielding member removably connected with the grill body in order to shield a lower opening of the grill body; and

blocking means for preventing the dust collector from being connected with the cyclone body when the shielding member is not assembled at the grill body.

6. The upright-type vacuum cleaner of claim 5, wherein the dust collector
15 is secured by a locking unit that moves upwardly and downwardly, and the locking unit is disposed at a lower part of the settling unit.

7. The upright-type vacuum cleaner of claim 5 or 6, comprises:

a locking lever rotatably disposed at a lower part of the grill body; and
a penetrating hole formed at a corresponding point in the shielding
20 member so that the locking lever can pass through at a certain position.

8. An upright-type vacuum cleaner substantially as described and illustrated herein with reference to Figures 2 to 6 of the accompanying drawings.



Application No: GB 0127889.4
Claims searched: 1-8

Examiner: Nicholas Mole
Date of search: 22 January 2002

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): A4F FFD B2P

Int Cl (Ed.7): A47L 9/16 B04C (5/02, 5/04, 5/06, 5/08, 5/103, 5/185)

Other: Online: WPI EPODOC JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	EP 0972573 A (HUMAN NET) see esp. figure 1	
A	EP 0928594 A (ROYAL) see esp. figures 8 and 10	

N	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.